METHODS FOR TRACKING EXPOSURES TO DRINKING WATER CONTAMINANTS IN CALIFORNIA

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Background and Aims: While infrastructure and regulations help assure the quality of drinking water to millions of California citizens, there continue to be areas where existing contaminant levels may pose residual risks to the population. To assess the extent of suspected exposures to continuing waterborne hazards, and the concurrent linkages to disease, requires several pieces of information. We aimed to enumerate this information in the context of available exposure assessment methods and with the goal of developing an ongoing tracking system.
Methods: Through literature review, targeted communications with technical experts, and needs assessment, we identified and prioritized methods for linking individuals or small populations to specific water supplies and for estimating exposures to contaminants, given available water quality observations. We assessed the feasibility of developing a drinking water quality tracking system in terms of cost, effort, expertise, information systems infrastructure, and external factors which affect the ability to use a method or to acquire additional related drinking water quality and delivery information.
Results: In California, 85% of the population receives its drinking water from regulated community water systems, while 15% use unregulated private sources. The most promising method for assessing exposures to populations on regulated water supplies involves modeling tap water quality from existing water quality monitoring records. The primary impediment to implementing this method is the lack of complete and high resolution geospatial information available for describing water purveyor service boundaries and for characterizing zones of homogeneous water quality within distribution systems.
Conclusions: To better analyze water contaminant exposures in California, a frequently updated and time-dependent geospatial reporting system is proposed for capturing water system service areas and hydraulically isolated distribution sub-zones. Once a complete statewide coverage of regulated supplies is attained, the remaining unregulated areas can be analyzed with respect to disease outcomes and risk-attributable ambient conditions.